

Docket No. LEE-0024 (FPC03005-PCT/US)

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REMARKS

Claims 1-18 are pending in the present Application. No claims have been canceled, amended, or added, leaving Claims 1-18 for consideration upon entry of the present Response. Reconsideration and allowance of the claims are respectfully requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-18 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Japanese Patent No. 05-074461 ("Yoshino") in view of Japanese Patent No. 10-302797 ("Noritake"). Applicants respectfully traverse this rejection.

Yoshino discloses a secondary battery negative electrode prepared using carbonaceous material as the active material. See Abstract. The active material includes styrene-butadiene latex with 40-95 wt% butadiene and 75-100% gel content. See Abstract.

Noritake discloses a copolymer for an electrode binder for batteries, containing 5-50 wt% vinyl cyanide monomer units, and a core-shell particulate with a core having a Tg of -100 to 0°C, and a shell made from a copolymer having a Tg of -5 to 50°C. See Abstract.

The binder according to the present invention (Claim 1) comprises composite polymer particles, which includes: both (a) a polymer based on monomers capable of controlling the cell property and (b) a polymer comprising monomers capable of controlling the adhesive strength; both (a) a polymer based on monomers capable of controlling cell property and (c) a polymer comprising monomers capable of simultaneously controlling the adhesive strength and the coating property; or all polymers (a), (b) and (c).

The primary feature of the novel technology according to the present invention lies in that general monomers, which form a binder polymer, are divided into monomers capable of controlling the cell property, monomers capable of controlling the adhesive strength, and monomers capable of simultaneously controlling the adhesive strength and the coating property. Another feature lies in that (a') *a polymer capable of controlling the cell property*, (b') *a polymer capable of controlling the adhesive strength*, and (c') *a polymer capable of simultaneously controlling the adhesive strength and the coating property* are polymerized separately from the

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monomers divided as described above so as to provide the binder for battery comprising composite polymer particles having the structure formed of two or more different phases.

As described on page 2, lines 18-22 of the Specification of the present application, Applicants have found that a binder having the structure formed of *two or more phases*, which are different from one another in terms of cell property, adhesive strength, and coating property, can provide superior adhesive strength, cell property, and coating property with respect to slurry to be coated on a collector. These effects are supported by the examples and the comparative examples in the Specification of the present application.

Yoshino fails to disclose or teach separate copolymerization of monomers capable of controlling the cell property, monomers capable of controlling the adhesive strength, and monomers capable of simultaneously controlling the adhesive strength and the coating property. The examples of Yoshino disclose preparing a binder comprising *a single polymer* prepared by polymerizing monomers by use of only one step, rather than polymerizing the detailed structure of the binder capable of controlling cell property, adhesive strength and coating property by use of two or more separate steps. Yoshino therefore fails to disclose all elements of the instant claims.

Noritake discloses preparing a binder having the core-shell structure, wherein the core is made of a (co)polymer having from -100 to 0°C glass transition temperature, and the shell is made of a (co)polymer having from -5 to 50°C glass transition temperature. Noritake thus only discloses control of the glass transition temperature of each of the core and the shell. One skilled in the art of core-shell polymers will appreciate that core-shell polymers are generally as described for impact modifiers having a rubbery core and harder exterior, where the glass transitions are typically as selected to provide complementary impact modification properties for the overall core-shell structure. One skilled in the art would therefore also reasonably conclude that the core-shell polymer of Noritake as disclosed is limited to properties of impact modification absent any description of further properties. Instant Claim 1 is silent as to impact modification. Noritake thus fails to disclose or teach a polymer or polymer system in which the constituent monomers are divided and separately copolymerized to control the cell property, the adhesive strength, and simultaneously the adhesive strength

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and the coating property, as claimed in instant Claim 1. Thus, Yoshino et al. and Noritake et al. neither disclose nor suggest all the features of the present invention, do not provide a suggestion or incentive that would have motivated the skilled artisan to modify a reference to provide the limitations of Claim 1, and further do not provide a reasonable expectation for success for the combination.

Even if a prima facie case of obviousness were conceded, which it is not, it is respectfully submitted that applicant's invention is not obvious because the particular combination of claimed elements results in unexpectedly beneficial properties. An applicant can rebut a prima facie case of obviousness by presenting comparative test data showing that the claimed invention possesses unexpectedly improved properties or properties that the prior art does not have. *In re Dillon*, 919 F.2d 688, 692-93, 16 U.S.P.Q.2d 1987, 1901 (Fed. Cir. 1990). As supported by Examples 1, 2 and 4 to 17 of the Specification of the present application, a binder which has (a) a polymer based on monomers capable of controlling the cell property as a separate phase can, when included, provide excellent cell properties when compared to Comparative Examples 1 and 2, in which monomers capable of controlling the cell property were copolymerized with monomers capable of controlling the adhesive strength, or with monomers capable of simultaneously controlling the adhesive strength and the coating property, in a single polymerization step so as to prepare a binder having a single phase (refer to the instant Specification, Table 1). Yoshino and Noritake neither disclose nor suggest the binder, which has a polymer based on monomers capable of controlling the cell property as a separate phase, and therefore the combination of Yoshino with Noritake fails to disclose all elements of the instant claims.

Accordingly, Claims 1-18 of the subject application are not unpatentable over Yoshino in view of Noritake.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

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Respectfully submitted,

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